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# Notes on *Hymenoscyphus* — 3: On the nomenclature of *Hymenoscyphus subcarneus* (*Ascomycota, Helotiales*)

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**Abstract** — Since 1964 the name of the bryopathogenic species *Hymenoscyphus subcarneus* (Cooke & Peck) Kuntze has been in current use, despite being illegitimate because of homonymy. Now there is no longer need to correct this name, because in 2006 the species was transferred to a new genus, *Roseodiscus*. Up to 1964 the species was classified in *Helotium* and correctly called *H. destructor*, a name erroneously ascribed to Peck. The older homonym *Hymenoscyphus subcarneus* (Schumach.) J. Schröt. seems to be incorrect as well. It was based on *Peziza subcarnea* Schumach., which was presented by Fries as a likely synonym of *Peziza carnea* Fr. As there is sufficient evidence to support this synonymy, the new combination *Phaeohelotium carneum* is proposed. Simultaneously some related species of the '*epiphyllus* group' of *Hymenoscyphus* are transferred to *Phaeohelotium*. A concluding review of earlier and later homonyms of *Peziza carnea* Fr. reveals the incorrectness of the author citations in the current names *Geopyxis carnea* and *Ombrophila lilacina* var. *carnea*.

**Key words** — *Helotiaceae*, new combinations

## Introduction

The name *Hymenoscyphus subcarneus* has been given to two different species of *Helotiaceae*: firstly in 1893 by Schröter (1893: 69, as '*Hymenoscypha subcarnea*') to a lignicolous species, secondly in 1898 by Kuntze (1898: 486) to a muscicolous one. However, instead of a simple case of homonymy wherein the older homonym has priority and the later one has to be rejected, the nomenclature of *Hymenoscyphus subcarneus* is more complicated. This article will clarify this matter.

## Materials and methods

For this study I made use of literature from the library of the Nationaal Herbarium Nederland and – concerning Cooke (1875) – from the library of the

Hollandsche Maatschappij der Wetenschappen (deposited in Leiden University Library), both at Leiden.

All literature mentioned has been consulted in the original, except Gmelin (1792) and Langlois (1887). References to these authors have been taken from a card-index concerning *Peziza* composed by the late Dr. R.A. Maas Geesteranus.

## Results and discussion

### *Hymenoscyphus subcarneus* (Cooke & Peck) Kuntze

*Hymenoscyphus subcarneus* (Cooke & Peck) Kuntze 1898 is a minute, muscicolous species, growing on and apparently killing foliaceous liverworts like *Jungermannia* sp. and mosses like *Dicranum flagellare*. Hitherto it has been collected in North America (Eastern USA, Canada) and Europe (Austria, Slovakia, Switzerland, Poland). Originally it was published in March 1875 as *Peziza subcarnea* Cooke & Peck (Cooke 1875: 295). The species was also described later the same year by Peck (1875: 107). The name *Peziza subcarnea* Cooke & Peck, however, is a later homonym of *Peziza subcarnea* Schumach. 1803, and therefore illegitimate. The oldest recombination of the epithet *subcarnea* Cooke & Peck has been made by Saccardo (1889: 265), who transferred the species to the genus *Phialea* (Pers.: Fr.) Gillet. According to Art. 58 of the International Code of Botanical Nomenclature (McNeill et al. 2006) this recombination must be treated as a new name, reading *Phialea subcarnea* Sacc. Because Kuntze (1898: 486) transferred the species to *Hymenoscyphus*, it should be cited as *Hymenoscyphus subcarneus* (Sacc.) Kuntze. This name, however, is illegitimate because of its homonymy with *Hymenoscyphus subcarneus* (Schumach.) J. Schröt. 1893 (published as '*Hymenoscypha subcarnea*'). Indeed, Baral & Krieglsteiner (2006: 12) incorrectly cited the year of publication of Kuntze's Revisio generum plantarum, pars 3 ('2'), as '1889', apparently following White (1942: 163), who also listed Kuntze's book with the incorrect date. On account of this error they point out on page 14, that Schröter (1893) transferred *P. subcarnea* Schumach. to *Hymenoscyphus* 'four years after O. Kuntze transferred *Peziza subcarnea* Cooke & Peck to that genus'. Had that been the case, *H. subcarneus* (Sacc.) Kuntze would not have been illegitimate.

When White transferred the species to the genus *Helotium* Pers., he also had to deal with the problem of homonymy because the combination *Helotium subcarneum* (Schumach.) Sacc. 1881 already existed. Hence he introduced the name *Helotium destructor* 'Peck' as an avowed substitute (White 1942: 163). White appeared to ascribe this nomen novum to Peck. Consequently it was cited as '*Helotium destructor* Peck ex W.L. White' in Review of Applied Mycology, Supplement 5: 57 (1942; a publication that was subsequently renamed as 'Index of Fungi'). There is, however, no evidence at all that this name or the description

had been created by Peck. Neither did White explicitly state that Peck – who had died 25 years before, in 1917 – contributed in some way to this publication. Because of this there is no reason to attribute the nomen novum to the author, in casu Peck, to whom it was seemingly ascribed (see ICBN Art. 46.2). On the contrary White (1942: 155) states that, among the species described by Peck in *Peziza*, one was transferred to *Helotium* by Saccardo, namely *Peziza albumina* Cooke & Peck, while the other two are transferred in the 'present' paper [of White], namely *Peziza subcarnea* Cooke & Peck and *Peziza planodisca* Peck & Clinton.[1] So we may assume that White's citation of Peck's surname is not meant as a reference to the author of a published or unpublished name, but merely as a reference to the original collector of the species. Such a reference, which is not a citation of the author of the name concerned, cannot form part of the full species name (cf. ICBN Art. 46.1) and can be considered an author's or editor's mistake. In my opinion, there is no real direct association between Peck and the new name or description or diagnosis of *Helotium destructor*, so in this case the term 'ascription' does not apply (see ICBN Art. 46.3). Lizoň (1992: 49) suggested, by citing '*Helotium destructor* Peck in White', that Peck himself had published the name and description in White's paper, but that suggestion is erroneous. All in all White's nomen novum for this species must be cited as *Helotium destructor* W.L. White, not as 'Peck', 'Peck ex White' or 'Peck in White'.

Since the revaluation of the generic name *Hymenoscyphus* Gray by Dennis in 1964, this species has been accepted as belonging to that genus for decades (Dennis 1964: 68, fig. 50; Carpenter 1981: 257; Lizoň 1992: 48–49). Recently Baral & Krieglsteiner (2006) studied material from Poland and Switzerland. They demonstrated that *H. subcarneus* (Cooke & Peck) Kuntze is closely related to the likewise pink-coloured *H. rhodoleucus* and *H. equisetinus*, both growing on stems of *Equisetum*. Because of the *Calycina*-type of annulus (apical ascus ring), these three species do not fit within the genus *Hymenoscyphus* so that a new genus *Roseodiscus* Baral, typified by *R. rhodoleucus*, was erected for them. As long as molecular data do not contradict this classification, it appears to be a justified position for *R. subcarneus* (Sacc.) Baral. As a consequence there is no longer a need to replace the illegitimate name *H. subcarneus* (Sacc.) Kuntze by a legitimate specific name within the genus *Hymenoscyphus*.

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[1] By White (1942: 171) erroneously mentioned as '*Helotium planodiscum* (Peck & Cooke)'. In the protologue the authors are cited as 'P. & C.' (Peck 1879: 46). In this report, however, Peck used 'C.' to indicate a number of different authors, i.a. Cooke, Curtis and Clinton. *Peziza planodisca* was collected, like all of the 'P. & C.' species described in this report, by G.W. Clinton. This indicates that 'P. & C.' stands for Peck & Clinton. Besides, Cooke was the senior author of discomycete names published while Peck was consulting with him a few years earlier, so it is very improbable that Peck in subsequent years would include Cooke as a junior author.

***Hymenoscyphus subcarneus* (Schumach.) J. Schröt.**

*Hymenoscyphus subcarneus* (Schumach.) J. Schröt. 1893 is a saprotrophic species growing mainly on decorticated wood or chips of deciduous trees. It has been reported from i.a. United Kingdom, Denmark, Germany, Belgium and the Netherlands. A collection from Switzerland, described and depicted by Breitenbach & Kränzlin (1981: 158–159 as *Phaeohelotium subcarneum*), seems to represent *Hymenoscyphus imberbis* (Bull. : Fr. ) Dennis, because the apothecia are not equably pink-coloured but white with wine-red spots (see Baral 1986: 17).

Its name is based on *Peziza subcarnea* Schumach. 1803. Fries did not sanction this name, but added to his description of *Peziza carnea* Fr.: '*P. subcarnea* Schumach. Saell. p. 427 huc pertinere videtur' (Fries 1822: 135). In the separately published index of the same work the name *P. subcarnea* Schumach. is equally arranged and provided with a question-mark (Fries 1832: 138). So Fries considered it likely synonymous with his own *P. carnea*. In 1849 Fries transferred *P. carnea* to the genus *Helotium*, without mentioning synonyms or presenting *P. subcarnea* as a separate species (Fries 1849: 356). This may be interpreted as though he had become convinced of the synonymy of both names. One could object that Fries did not present *P. subcarnea* Schumach. unreservedly as synonymous with *P. carnea* Fr. Actually this discrepancy is of minor importance. The point is whether the two names are synonymous or not. If so, one must use the specific epithet *carnea* Fr. for the species concerned; if not, both epithets are available for the respective species.

According to the original description based on fresh specimens, *Peziza carnea* Fr. is an autumnal SPECIES with small, up to 2.5 mm ('½ to 1 line') wide, subsessile, soft-fleshed ('fleshy-waxy'), smooth, convex, flesh-coloured apothecia, occurring on dead, decorticated wood of i.a. *Fagus* and *Carpinus* (Fries 1822: 135). Fries classified it in section *Lenticulares*, together with other saprotrophic species with more of less flat to slightly convex, sessile to short-stalked apothecia, like *P. imberbis*, *P. faginea* and *P. epiphylla*. These three relatives are microscopically characterized by i.a. an outer excipulum of thin-walled textura globulosa to angularis, asci originating from croziers and ellipsoid, non-scutuloid, asetulose spores (Hengstmengel 1984). They form a rather homogeneous group, which was called stirps *Epiphylleae* (of the genus *Helotium*) by Dennis (1956: 67) and '*epiphyllus* group' (within the genus *Hymenoscyphus*) by Dumont (1981: 60). To this '*epiphyllus* group' also belongs the smooth, soft-fleshed, pale purplish-pink, lignicolous *Hymenoscyphus subcarneus* (Schumach.) J. Schröt., not only because of its similarity in morphological and anatomical characters, but also because of the resemblance

in ultrastructure of the ascus apical apparatus between the latter and *H. imberbis*, as was demonstrated by Verkley (1993). Actually *H. subcarneus*, originally collected on rotten wood of *Betula alba* in Saelland (Denmark), cannot be distinguished from *Peziza carnea* Fr. as macroscopically described by Fries (1822: 135). For this reason I judge these two species synonymous, also supported by Fries's opinion about their resemblance. Unfortunately there is no type material preserved for microscopical comparison.

Likewise Saccardo (1889: 240), Rehm (1892: 657) as well as Schröter (1893: 69) considered *P. carnea* Fr. synonymous with *P. subcarnea* Schumach. They used for this taxon the non-sanctioned epithet *subcarnea* Schumach., combined with the generic names *Pezizella* and *Hymenoscypha* respectively. This was presumably correct at that time, for previous to the introduction of the 1821 starting point for 'Fungi caeteri', *P. carnea* Fr. was considered unavailable as being a later synonym, besides being a later homonym. However, *P. carnea* Fr. became the earliest available name under the 1821 starting point, and continues to have priority as a sanctioned name (Art. 15.1) under the 1753 starting point of the current ICBN.

*H. subcarneus* (Schumach.) J. Schröt. is currently placed in the genus *Phaeohelotium* Kanouse (Dennis 1981: 130–131, pl. XXIX K; Hansen & Knudsen 2000: 159; see also www.indexfungorum.org, record number 319579). I fully agree with that classification, because the species of this genus have similar morphological, anatomical, and ecological characters. *Ph. subcarneum* (Schumach.) Dennis does not show the light brown coloration and punctation of the wall in (over)mature spores, as known in i.a. *Ph. monticola* (Berk.) Dennis (= *Ph. flavum* Kanouse, the type species of the genus) and after which the genus *Phaeohelotium* is named. This character, however, is neither observed in some other species of *Phaeohelotium*, like *Ph. nobile* (Velen.) Dennis and *Ph. trabinellum* (P. Karst.) Dennis (Dennis 1971: 356; Hansen & Knudsen 2000: 159). Besides, the brown coloration has also been found in species outside *Phaeohelotium* and outside the '*epiphyllus* group' of *Hymenoscyphus*, e.g. in *H. salicellus* (Fr. : Fr.) Dennis (Hengstmengel 1984: 82), *H. serotinus* (Pers. : Fr.) W. Phillips (collection HMAS 96819 = HB 5830), *Rutstroemia firma* (Pers.: Fr.) P. Karst. (Galán & Baral 1997: 61) and *Lambertella torquata* W.Y. Zhuang (Zhuang 1995: 42). So this character is neither obligate nor exclusive for species of the genus *Phaeohelotium* and thus not differentiating at the generic level. Probably it is not even an essential character (Dennis 1981: 130).

Because of the nomenclatural priority of *Peziza carnea* Fr. : Fr. over its non-sanctioned synonym *P. subcarnea* Schumach., the following combination is proposed:

***Phaeohelotium carneum*** (Fr. : Fr.) Hengstm., **comb. nov.**

MycoBank 512025

**Basionym**: *Peziza carnea* Fr. : Fr., Syst. mycol. 2 (1): 135 (1822), non (Hedw.) J.F. Gmel. 1792, nec Pers. 1822, nec (Pers. : Fr.) P. Karst 1869, nec Ellis & Everh. 1887 [nom. nud.], nec Cooke & W. Phillips 1887

≡ *Helotium carneum* (Fr. : Fr.) Fr., Summa veg. Scand. (2): 356 (1849)

= *Peziza subcarnea* Schumach., Enum. pl. Saell. 2: 427 (1803), non Cooke & Peck 1875

≡ *Helotium subcarneum* (Schumach.) Sacc., Michelia 2 (2): 260 (1881)

≡ *Pezizella subcarnea* (Schumach.) Rehm, Rabenh. Krypt.-Fl. ed. 2, 1 (3) (38): 657 (1892)

≡ *Hymenoscyphus subcarneus* (Schumach.) J. Schröt., Pilze Schles. 2 (1): 69 (1893) [as '*Hymenoscypha subcarnea*'], non (Sacc.) Kuntze 1898

≡ *Calycina subcarnea* (Schumach.) Kuntze, Revis. gen. pl. 3 (3): 449 (1898)

≡ *Orbiliopsis subcarnea* (Schumach.) Höhn., Mitt. Bot. Inst. T.H. Wien 3 (3): 102 (1926)

≡ *Phaeohelotium subcarneum* (Schumach.) Dennis, Kew Bull. 25 (2): 355 (1971)

The recognition of *Phaeohelotium* as a genus separate from *Hymenoscyphus* is fully justified by the obvious differences in i.a. the structure of the excipulum and the ascus apical apparatus, and is supported by molecular evidence. Recently some molecular phylogenetic investigations, based on sequence analyses of the rDNA ITS1-5.8S-ITS2 region, have been done in a number of *Helotiaceae* and other *Helotiales* (Zhang & Zhuang 2004, Baral et al. 2006, Boonyuen et al. 2006, Zhuang & Liu 2007). These studies confirm that *H. epiphyllus* is placed in a sister group (with high bootstrap support) to *Hymenoscyphus* sensu stricto (= *H. fructigenus* (Bull. : Fr.) Gray and allied species with scutuloid ascospores). Hitherto too few species of the '*epiphyllus* group' or the genus *Phaeohelotium* have been investigated molecularly to be able to say something about the size and content of this sister group.

Being *H. subcarneus* rightly classified in the genus *Phaeohelotium*, as argued above, other species of the '*epiphyllus* group' should be classified in *Phaeohelotium* as well. Up to now this is only partially the case. *Hymenoscyphus imberbis*, for instance, was already transferred to *Phaeohelotium* by Svrček (1985: 152), but *H. epiphyllus* (Pers. : Fr.) Rehm ex Kauffman with its var. *acarius* (P. Karst.) Hengstm., *H. carpinicola* (Rehm) Arendh. and *H. fagineus* (Pers. : Fr.) Dennis have not yet been transferred. Therefore the following new combinations are added:

***Phaeohelotium carpinicola*** (Rehm) Hengstm., **comb. nov.**

MycoBank 512565

**Basionym**: *Helotium carpinicola* Rehm, Hedwigia Beibl. 35 (6): (146) (1896) [as '*carpinicolum*']

***Phaeohelotium epiphyllum*** (Pers. : Fr.) Hengstm., **comb. nov.**

MycoBank 512512

**Basionym**: *Peziza epiphylla* Pers., Annln. Bot. (ed. Usteri) 11: 30 (1794) : Fr., Syst. mycol. 2 (1): 137 (1822); non Schumach. 1803

***Phaeohelotium epiphyllum* var. *acarium*** (P. Karst.) Hengstm., **comb. nov.**
MycoBank 512513
**Basionym**: *Peziza epiphylla* var. *acaria* P. Karst., Monogr. Peziz. fenn.: 143 (1869)

***Phaeohelotium fagineum*** (Pers. : Fr.) Hengstm., **comb. nov.**
MycoBank 512514
**Basionym**: *Peziza faginea* Pers., Neues Mag. Bot. 1: 114 (1794) : Fr., Syst. mycol. 2 (1): 136 (1822)

**Published earlier and later homonyms of *Peziza carnea* Fr. : Fr.**

The publication by Fries (1822: 135) of *Peziza carnea* Fr. : Fr. has consequences not only for the availability of synonyms but also of earlier homonyms.

Already in 1792 Gmelin published the name *Peziza carnea* (Hedw.) J.F. Gmel., being based on *Octospora carnea* Hedw. 1789 (Gmelin 1792: 1458). Although this recombination must be treated as rejected in favour of the sanctioned *P. carnea* Fr. : Fr., it is not illegitimate but unavailable for use (ICBN Art. 15.2). However, since the beginning of the nineteenth century it is considered synonymous with the current name *Ascocoryne sarcoides* (Jacq. : Fr.) J.W. Groves & D.E. Wilson; see e.g. Persoon (1801: 633), Fries (1822: 168) and Saccardo (1889: 642). Besides being sanctioned, the basionym of the latter, *Lichen sarcoides* Jacq. 1781, has priority over its heterotypic synonym *Octospora carnea* Hedw. 1789. Consequently the correct name for this species is a combination based on Jacquin's name and the name *P. carnea* (Hedw.) J.F. Gmel. can remain an unavailable heterotypic synonym.

In 1822, in the same year as (but earlier than) the publication of *Peziza carnea* Fr. : Fr., Persoon (1822: 301) published *P. carnea* Pers. The latter is not only unavailable as a name because of the status of *P. carnea* Fr. : Fr., but also illegitimate as a later homonym of *P. carnea* (Hedw.) J.F. Gmel. 1792. For this reason it may not serve as a basionym of another name or combination based on the same type (ICBN Art. 15.2). Fries, however, acknowledged Persoon's taxon and changed its rank to varietal by recombining the epithet *carnea* Pers. into '*P. lilacina* β. *P. carnea* Pers.', a name which has to be altered to *P. lilacina* var. *carnea* (ICBN Art. 24.4).[2] The resulting name is treated as new and the

[2] In the Systema mycologicum – as in several other botanical and mycological works from the nineteenth century with one or more infraspecific ranks – the infraspecific taxa marked with a Greek minuscule have the rank of variety, as Fries often explicitly mentions. See e.g. Fries (1821: 352): 'Praesens varietas ...', or Fries (1822: 129–130): 'Sequens varietas ...'. There is one exception, in which Fries refers to some infraspecific taxa marked with Greek minuscules as 'Subspecies sequentes' (Kuyper, pers. comm.), viz. in *Agaricus fibula* Bull. : Fr. (Fries 1821: 163–164). Among these 'subspecies' is '*A. fibula* γ. *Swartzii*', based on *A. swartzii* Fr. 1815. In the index of the same work Fries points out with regard to this *A. swartzii* Fr. to consider this taxon as a **variety** of *A. fibula* (Fries 1832: 44). This means that he used the term 'subspecies' not as the name of a definite rank, but to indicate taxa below species level. Therefore I see no reason to deny the general rule, that in the cited work Greek minuscules – unless otherwise stated – are used for varieties.

correct author citation of this variety is 'Fr. : Fr.', not '(Pers.) Fr.' (ICBN Art. 58). Since Saccardo (1889: 614) transferred this taxon to the genus *Ombrophila*, as '*Ombrophila lilacina* β. *O. carnea* Pers.', its correct name is ***Ombrophila lilacina* var. *carnea* (Fr. : Fr.) Sacc.**,[3] not '(Pers.) Sacc.' as is currently cited.

There exist at least three later homonyms of *P. carnea* Fr. : Fr. Their illegitimacy is, of course, in the first instance due to the existence of the earliest though unavailable one, namely *P. carnea* (Hedw.) J.F. Gmel. 1792.

In 1869 Karsten (1869: 120) created the homonymous recombination *Peziza carnea* (Pers. : Fr.) P. Karst. There is no need to rectify this name, which was based on *Ascobolus carneus* Pers. : Fr., because it is no longer current. Nowadays the species concerned is called *Iodophanus carneus* (Pers. : Fr.) Korf.

In 1887 the name *Peziza carnea* Ellis & Everh. was published in Langlois (1887: 32). Whatever this species may be, its name was accompanied neither by a description or diagnosis nor by a reference to a previously and effectively published description or diagnosis (thus being a nomen nudum) and therefore it was not validly published (ICBN Art. 32.1(d)).

About simultaneously W. Phillips published the new terrestrial species *Peziza carnea* Cooke & W. Phillips, based on a British collection of '*Peziza cupularis* L. var.' in the herbarium of M.J. Berkeley (Phillips 1887: 48). Saccardo (1889: 65) transferred the species to the genus *Geopyxis* and called it *Geopyxis carnea* 'Cooke et Phill.'. Because of the illegitimacy of the basionym, this recombination must be treated as a new name and has to be cited as ***Geopyxis carnea* Sacc.**, not '(Cooke & W. Phillips) Sacc.' (ICBN Art. 58).

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[3] Also in Saccardo (1889) the infraspecific rank marked with a Greek minuscule is the varietal rank. Besides, in this work a variety can be marked by the word "Var." or by the combination of this abbreviation with a Greek minuscule, e.g. "Var. β".

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